

**AEGLA EXPANSA, NEW SPECIES (CRUSTACEA:
DECAPODA: ANOMURA: A EGLIDAE), FROM THE LOWER BIO-BIO
RIVER BASIN, CONCEPCION, CHILE.**

**AEGLA EXPANSA, NUEVA ESPECIE (CRUSTACEA: DECAPODA:
ANOMURA: A EGLIDAE), DEL SECTOR INFERIOR DE LA CUENCA
DEL RIO BIO-BIO, CONCEPCION CHILE.**

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ABSTRACT

Aegla expansa, new species (Decapoda: Anomura: Aeglidae), from a small forest stream in Concepción province, Chile, is described. Its most salient features are: 1) greatly swollen chelae with expanded suberescentic palmar crest; 2) earlobe-like expansion at rear end of palmar crest fitting in wide embayment at distodorsal end of carpus; 3) dorsal surface of chelae densely covered by minute subacute scales; 4) rostrum broad, ligulate, longitudinally excavated both sides of rostral carina; 5) extraorbital sinus wide, separated from orbital sinus by two spines; 6) gastric and cardiac areas markedly convex and protuberant; 7) carapace branchial margins crenulate; 8) venter of fourth thoracic sternum smooth; 9) anterolateral angle of second abdominal epimeron sharply acute. Because the shape of the carapace and rostrum it resembles *A. araucaniensis* Jara but the shape of the palmar crest approaches it to *A. laevis laevis* (Latreille) and *A. laevis talcahuano* Schmitt. The expanded palmar crest of *A. expansa* was probably acquired independently from that found in the Brazilian *A. schmitti* Hobbs III.

KEYWORDS: Crustacea, Anomura, *Aegla*, new species, Bío-Bío river, Chile.

RESUMEN

Se describe *Aegla expansa*, nueva especie (Decapoda: Anomura: Aeglidae), recolectada en un riachuelo de la provincia de Concepción, Chile. Se caracteriza por tener: 1) quelas voluminosas, con cresta palmar subdisciforme muy expandida; 2) extremo posterior de la cresta palmar extendida en forma de lóbulo auricular cuyo borde encaja en un amplio seno sobre el extremo distodorsal del carpo; 3) superficie dorsal de las quelas con densa cubierta de diminutas escamas subagudas; 4) rostro ancho, ligulado, excavado longitudinalmente a ambos costados de la carena rostral; 5) seno extraorbital ancho, separado del seno extraorbital por dos espinas; 6) áreas gástrica y cardíaca marcadamente convexas y protuberantes; 7) márgenes branquiales serrados; 8) superficie ventral del cuarto esterno torácico lisa; 9) ángulo del segundo epímero abdominal agudo. Por la forma del caparazón y del rostro *A. expansa* se asemeja a *A. araucaniensis* Jara, en tanto que por la forma de la cresta palmar se asemeja a *A. laevis laevis* (Latreille) y *A. laevis talcahuano* Schmitt. Es muy probable que la amplia cresta palmar haya sido adquirida independientemente por *A. expansa* y por *A. schmitti* Hobbs III de Brasil.

PALABRAS CLAVES: Crustacea, Anomura, *Aegla*, nueva especie, río Bío-Bío, Chile.

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INTRODUCTION

Among the about 40 species of *Aegla* heretofore described (see Martin & Abele, 1988), there is a small number distinguished by possessing one or two very characteristic morphological features. One of this is *A. schmitti* Hobbs III, 1979, from Curitiba, Brazil, which has a broadly expanded and deeply excavate subdisciform chelipedal palmar crest, almost as wide as the palm proper. Because of that Hobbs III (1979:987) stated that *A. schmitti* stands far out from the remaining species of *Aegla*, though he mentioned the Brazilian *A. castro* Schmitt, *A. o. odebrechtii* Müller and *A. o. paulensis* Schmitt, as its morphologically closest relatives. In this paper a new species of *Aegla* is described, based on only one adult male specimen collected in the province of Concepción, Chile, which also features an enlarged palmar crest.

Aegla expansa, new species.

Figs. 1a, b, c, d, e, f, g, h, i, k, l, m, n, o, p, q, r.

HOLOTYPE

Instituto de Zoología, Universidad Austral de Chile, TZUA C-761, adult male; Hualqui river at La Leonera, about 6 km east of Hualqui (36° 58' S, 72° 56' W), and 24 Km south of Concepción, VIII Región, Chile; 10 february 1987; J. Llanos coll.

DIAGNOSIS

Rostrum long, broad ligulate, longitudinally excavated both sides of prominent dorsal carina; extraorbital sinus wide U-shaped, separated from orbital sinus by two spines, one above the other; gastric and cardial areas midline markedly convex and protuberant; carapace branchial margins crenulate; propodus of chelae greatly swollen; palmar crest expanded as dorsally concave earlike lamina, its rear end fitting in wide embayment of distodorsal end of carpus; dorsal surface of chelae densely covered by minute subacute scales; venter of fourth thoracic sternum smooth; anterolateral angle of second abdominal epimeron sharply acute.

DESCRIPTION

Carapace almond-shaped; gastric and cardial areas markedly convex and rotundly prominent along midline. Dorsal surface of cephalothorax and abdomen finely punctate.

Rostrum long and broad, surpassing cornea by at least one cornea length, triangular at base, ligulate in the middle and conical at apex; apex recurved and tipped by acute conical scale. Rostral margins with row of closely packed lenticular scales; at rostral apex marginal scales become flat and more separated. Apical scale surrounded by four tiny ones.

Rostral carina markedly prominent, extended from protogastric eminences to base of rostral apex; there it merges into rostral body; ridge of carina with irregular band of lenticular scales; about three rows of them at the most elevated point of it, one row on distal carina, and irregular patch of 7 or 8 scales on dorsum of rostral apex. On both sides of carina deep and wide trough make rostral margins appear rimmed.

Orbital sinus deep, separated from extraorbital sinus by small conical spine, its apex turned laterad; below it and slightly displaced to body midline a similar but smaller spine pointing out straightforwardly. Extraorbital sinus wide and shallow. Anterolateral spine acute, slightly upturned, arising from flat dorsum of anterolateral lobe; this last one rough, its external margin with irregular row of scales similar to those on rostral margins.

Gastric area markedly convex and prominent, most elevated at level of third hepatic lobes. Epigastric prominences wedge-shaped (cuneate), most prominent just behind deepest point of orbital sinuses; summit of left one crater-like, surrounded by 8 or 9 tiny conical scales; summit of right one scabrous and tipped by 9 or 10 scales. Protogastric eminences low but well-defined, summits tipped by 1 or 2 flat lenticular scales. Sparse tiny lenticular scales forming broad band along midline of gastric area.

Hepatic lobes separated by shallow grooves forming noticeable indentations at margin of carapace. First hepatic lobe separated from anterolateral lobe by wide deep notch, its antero-

lateral angle tipped by small acute scale not particularly more prominent than those forming irregular scabrous row along hepatic margin. Dorsum of first and second lobes excavate; third slightly swollen. Posterior gastric pits (see Martin and Abele, 1988) scarcely marked. Cervical groove well-defined, particularly narrow and deep between posterolateral portions of gastric area and innermost part of swollen inner branchial areas. Pterygostomial angle tipped by short stout spine.

Cardiac area almost as long as wide. Areola broad, markedly convex and prominent, summit reaching same height as gastric area; frontal end subtriangular, distal point raising sharply from wide central part of cervical groove, carrying patch of about 10 loosely packed tiny lenticular scales. Dorsum of branchial areas sloping down at rather pronounced angle to not particularly expanded branchial margin; row of tiny conical scales along *linea aeglica lateralis* (see Martin and Abele, op. cit.). Posterior branchial margin slightly upturned. Epibranchial tooth prismatic and moderately prominent, external margin with row of tiny conical scales, that at summit twice as large as remaining scales. Border of anterior branchial area minutely denticulate; denticles dorsoventrally depressed, separated by shallow notches; each with irregular row of conical scales, anteriormost being most prominent. Nine denticles on left side and eight on right side. Border of posterior branchial area with single row of tightly packed tiny scales. Right posterior branchial area deformed by bump probably of traumatic origin.

Abdominal epimera deeply punctate. Dorsum of second excavate; anterodorsal angle spiniform, tipped by short conical scale, posteriorly merging into epimeron through broad ridge. Anteroventral angle rounded off. Lateral surface of epimeron, between anterodorsal and anteroventral angles, markedly concave. Angle of third and fourth epimera also acutely tipped. In this specimen left fourth angle shattered. Telson plate dimerous, subpentagonal. Anterolateral angles of third thoracic sternum as small compressed knobs, apex of axial portion blunt and flanked by 3 scales. Fourth thoracic sternum flat.

Chelipeds very large and bulky, left larger. Ventromesial border of basi-ischiums with round,

broad-based knob proximally and small conical knobs tipped by scale distally; one distal knob on left and three on right. Ventromesial border of merus with one prominent conical spine at distal end, and similar but somewhat smaller spine at corresponding site on external ventrolateral border. Externalmost point of distoexternal articular lobe of merus with small subapical spine; proximal half of dorsal longitudinal ridge straight or at most sinuous; distal half with row of acute small tubercles increasing in size distally, three tubercles on the left and five on the right merus. Distodorsal margin of merus with a very low and ill-defined median tubercle recognizable by short transversal row of three to four worn-off conical scales; external to it somewhat scabrous border bearing irregular row of tiny scales.

Carpus massive; carpal crest formed by four clear-cut, conical, slightly upturned spines increasing in size distally; carpal lobe long, markedly displaced towards distodorsal end of carpus, leaving large concave gap between it and distalmost spine of carpal crest; carpal lobe low and rounded off, bearing small subacute scale at summit; on left cheliped tip of it is broken. Dorsal ridge of carpus well developed, made up of seven broad based tubercles tipped by a somewhat oblique row of three to seven blunt conical scales, that at summit largest. Lateroexternal ridge of carpus almost absent; from its remains one (left) or two (right) flat tubercles bearing at front row of small lenticular scales. Ventral face of carpus with short stout conical tubercle tipped by small scale leaning distally; some short stiff setae between ventral and crestral spines.

Chelae ovoid in outline, bulky and markedly inflated at both dorsal and ventral faces, especially left one. Ventroexternal ridge of palm, between lateroexternal knob of carpo-palm joint and apex of fixed finger, arcuate, broad and faintly marked on right hand but absent on left except at distal end where it merges into body of fixed finger. Palmar ventrocentral area swollen, traversed obliquely by row of four widely separated, flat, scale-tipped, small tubercles. Fixed finger relatively short, stout, deeply concave at ventral side, cutting edge pronouncedly recurved (J-shaped) when seen from above; margin of palm-dactylus joint with row of tiny scales.

Dorsum of palms covered by tiny, flat, lenticular to conical scales which become more prominent on lateroexternal distal half. Palmar crest expanded as ear-shaped lamina, larger on right hand; dorsum of lamina markedly concave and profusely studded by minute scales, larger at upturned margin, forming a marginal band; earlobe-like rear end of crest markedly recurved, fitting into wide indentation between tip of carpal lobe and distal spine of carpal crest when chela flexes upon carpus. Ventrally, palmar crest arises directly from proximal palmar border without furrow or trough separating them; ventromarginal face scabrous and scaly. Dactylus of chelae noticeably recurved; when chelae close dactylus and fixed finger contact only at their tips leaving wide gap along most of them; dactylus with sharp spiniform lobe on proximal end (right hand) or two to three tiny acute scales in row at corresponding site (left hand).

Pereiopods robust. Distodorsal margin of merus fringed by short stiff setae intermingled with tiny indentations; small acute tubercle at midpoint. Posteroventral margin of merus minutely serrate. Distodorsal end of carpus acute but not prominent. Distal third of ventral margin of dactylus with row of 10 to 14 tiny spiniform slender scales.

MEASUREMENTS

The dimensions of the holotype are given in Table I. Measurements were made with calipers to the nearest 0.1 mm. Morphometric characters considered are those defined by Jara and López (1981); to those, five others (marked with asterisk) are added to provide quantitative grounds for comparison of *A. expansa* with *A. schmitti* Hobbs III.

Sex	:	male
1	CL	: 33,4
2	RL	: 7,0
3	PCL	: 23,0
4	FW	: 10,7
5	PCW	: 20,8
6	CW	: 27,4
7	LCL	: 53,7
8	RCL	: 48,8

9	L2PL	: 41,0	
10	L2DL	: 10,0	
11	L4DL	: 10,1	
12	TL	: 6,5	
13	MPD (*)	: 10,9 (left);	7,9 (right)
14	PL (*)	: 24,7;	20,0)
15	PW (*)	: 19,6;	14,4
16	LBPC (*)	: 8,2;	6,6
17	MW2M (*)	: 3,6;	3,7

TABLE I. Somatometry of *A. expansa*, new species, holotype. All measurements in mm. CL, carapace length, between rostral apex and posterior margin of cephalothorax; RL, rostral length, between rostral tip and midpoint of transversal line tangent to deepest point of orbital sinuses; PCL, precervical length, between rostral tip and midpoint of cervical groove; FW, frontal width, between tips of anterolateral angles of carapace; PCW, maximum precervical width, distance across third hepatic lobes; CW, maximum carapace width; LCL, left cheliped length; RCL, right cheliped length; L2PL, length of second left pereopod; L2DL, dactylar length of second left pereopod; L4DL, dactylar length of fourth left pereopod; TL, telson length; MPD, maximum palmar dorsoventral depth; PL, palmar length, between ventral inner knob of palm-carpus joint and fixed finger tip; PW, palmar width, between ventral knob of palm-dactylus joint and outermost point of ventroexternal margin of palm; LBPC, basal length of palmar crest; MW2M, maximum width of second pereopod merus.

COLOR

The true color of the preserved carapace appeared once a black patina covering it was removed. Even then the black matter remained adhered to many points, particularly to the punctae on the abdomen and appendages.

Dorsum of cephalothorax and abdominal terga violaceous wine, darkest on anterolateral lobes of carapace, hepatic lobes, slopes of gastric area including protogastric lobes, along gastric midline between proximal end of rostral carina and cervical groove, and on inner half of posterior branchial areas. Violaceous lighter on both sides of rostral carina, behind external orbital margin, at epigastric eminences, both sides of middorsal line on posterior half of gastric area, areola, outer half of anterior and posterior branchial areas. Cream-white on summit of rostral carina, margin of orbital sinuses,

furrows and depressions of the carapace, frontal articular face of abdominal terga, and ventral face of pereopods least the dactylus. Pale orange to red orange on ventral face of cutting edges of chela, and palm-dactylus articular knob. Dorsum of chelipeds with dirty grayish hue upon indefinible creamy background.

DISTRIBUTION.

Known only from the type locality, a small river which drains a seemingly small basin on the northern margin of Bío-Bío river, Concepción province, VIII Región, Chile.

NATURAL HISTORY

Nothing is known about the natural history of *A. expansa*, and possibly little will be known in the future as the small basin in which the type locality is located is being drastically altered by forestry exploitation. A short visit made to the spot on 18 september 1988 allowed to observe a moderately fast running stream, 4 to 5 meters wide and no more than 1 meter deep, in a narrow creek. Water was yellowish brown in color and very turbid; the unstable substrate was a mixture of fine sand and coarse gravel rich in mica and quartz. It evidently had smothered the once stony or rocky bottom with up to 40 cm deep layer of loose material. No *Aegla* specimens were found after two hours of collecting efforts along 200 m stretch of river.

ETYMOLOGY:

From *expansa* (Latin), expanded. Alluding to the broad palmar crest of the chelipeds that characterizes this species of *Aegla*.

COMPARISON:

On morphological ground *A. expansa* appears unrelated to the Brazilian *A. schmitti*, *A. castro*, *A. o. odebrechtii* and *A. o. paulensis* that also have greatly expanded palmar crests (see Hobbs III,

1979), but on the other hand *A. expansa* does not appear particularly related to any Chilean species either. *A. expansa* differs from the Brazilian species mainly in the shape of the palmar crest and rostrum. In *A. expansa* the palmar crests are subeliptical, comparatively little protuberant outgrowths of the posteroventral border of the palm, scarcely forming an independent unit beyond the palm itself. This situation is clearly appreciated when viewing the palm from underneath, because there is no trough or furrow along the crestal base as is found in *A. schmitti* and *A. castro*. In *A. o. odebrechtii* the ventral face of the palmar crest is much the same as in *A. expansa* but its rear end does not form an ear-like lobe. Furthermore, the shape of the chelae is different too. In *A. expansa* the palms are so inflated that the lateroexternal ridge on their ventral side, between the tip of the fixed finger and the ventral knob of the palm-carpus joint, is scarcely marked. In contrast, *A. o. odebrechtii* has three well marked ridges grossly punctate: one at the very base of the palmar crest, one along the median line of the palm and one between the tip of the fixed finger and a point just inside the ventral knob of the palm-carpus joint. The central ridge is obsolescent in *A. prado* and *A. schmitti*. In dorsal view the chelae of *A. expansa* are regularly ovoid while those of *A. schmitti* and *A. odebrechtii* are subrectangular in outline; those of *A. castro* are almost as ovoid as those of *A. expansa* but are markedly dorsoventrally depressed, so that their lateroexternal border is very narrow while in *A. expansa* it is rotund blunt. The orientation of the palmar crest differs between Chilean and Brazilian species as well; in *A. expansa* the crest extends in the same horizontal plane as the rest of the chela, while in *A. schmitti* and *A. castro* the crestal lamina is downwardly inclined, so that it forms a wide angle respect to the horizontal plane of the chela. Other differences include the shape of the carpal crest: in *A. expansa* it is formed by a row of three rather big conical spines which increase in size distally and therefore the distal spine, behind the distal carpal lobe, is the largest; in the Brazilian species instead the carpal crest is formed by four or five also conical spines but the largest in the row is the predistal one, while the distal spine is less than half robust the precedent and is slightly dorsad

displaced. At the large embayment of the left cheliped of *A. expansa*, between the distal spine and the carpal lobe, there is a small protuberance where, in the Brazilian species, the small distal spine is found.

The rostrum of *A. expansa* appears as the paradigm of the Pacific rostrum type characterized by Schmitt (1942). The long ligulate rostrum, elegantly upturned at the acute tip, markedly troughed on both sides of the pronounced rostral carina, and outlined by wide, slightly upturned margins, differs greatly from the comparatively shorter, steep sloped, scarcely marginated and untroughed rostra of the Brazilian species. On the other hand, *A. expansa* resembles *A. schmitti* in having a prominent subrostral process (see Martin and Abele, 1988), but the shape of it differs markedly between both species.

The shape of the carapace of *A. expansa* is however quite similar to that of *A. schmitti* and even more to that of *A. castro*. In the last species the gastric area elevates above expanded and almost flat hepatic lobes as it occurs in *A. expansa* and the cardiac area has wide protuberant areola, similar to that of the Chilean species. They differ because in *A. expansa* the frontal end of the areola raises abruptly above a wide depression of the central part of the cervical groove which does not exist in any of the Brazilian species. Another difference is the microdenticulation *A. expansa* has at the margin of the anterior branchial area, which resembles the larger denticles present in the Chilean species *A. denticulata* Nicolet and *A. bahamondei* Jara, and which Brazilian species lack.

A. expansa partially shares morphological features with at least three Chilean aeglids, namely, *A. laevis laevis* Latreille, *A. laevis talcahuano* Schmitt, and *A. araucaniensis* Jara. With the first and third species it shares the almond-shaped carapace and ligulate rostrum. This last particularly similar to that in *A. araucaniensis*. With both *laevis* it shares a low blunt carpal lobe, globose bulky chelae and expanded palmar crest. With all three it shares flat fourth thoracic sternum, acute anterolateral angle of second abdominal epimeron, surface of carapace distinctly punctate, tubercles on carpal dorsal ridge elongate nodulose and tipped by an oblique row of flat lenticular scales, and the

surface of chelae studded by small elongate flat to conical scales.

A. expansa differs from *A. l. laevis* and *A. araucaniensis* in having a comparatively higher rostral carina ridged by conspicuous band of scales; a well defined extraorbital sinus limited at internal end by prominent clear-cut orbital spine; the margin of palmar crest entire including the palmar lobe, therefore without right angled notch at distal end of the crest; and the margin of the palmar crest suberescence instead of subrectangular.

With *A. l. talcahuano* it shares the suberescence palmar crest, the lack of a right-angled notch between the distal end of the crest and the palmar lobe, and the orbital spine. *A. expansa* differs from *A. l. talcahuano* in having a markedly upturned backward extension of the palmar crest which fits in the ample embayment between the distal spine of the carpal crest and the distal carpal lobe; a clear-cut orbital spine that delimits a U-shaped extraorbital sinus; prominent epigastric eminences; raised rostral carina with notorious band of scales along its ridge; and flattened hepatic lobes and anterolateral lobe of carapace.

The particular delimitation of the orbit and extraorbital sinus by a pair of distinct spines, one above the other, is also found in *A. rostrata* Jara and *A. bahamondei* Jara, but apart from this feature there seems to be no others in common between the above mentioned species and *A. expansa*.

REMARKS

The general area of the Nahuelbuta Cordillera, and in particular the area around Concepción city, seems to be a "hot spot" in the evolutionary history of the Chilean Aeglids. In fact, at least four species and one subspecies have been previously recorded in the territorial stretch between Imperial to the south and Talcahuano to the north (see Schmitt 1942, Jara 1982, 1986). Of these, three, namely *A. concepcionensis*, *A. l. talcahuano* and *A. papudo* have been recorded from nearby Concepción city and to them *A. expansa* is now added. The reasons for such a high diversity of aeglids in that restricted geographical area are far from being clear but it is interesting to note that none of the records have

been made from the Bío-Bío river (see Bahamonde and López, 1963), the main freshwater body in the area. Unfortunately the sampling effort for aeglids in the area of Concepción has been meager and therefore it is premature to advance any zoogeographical hypothesis. Moreover, the profound environmental alterations induced by the human population in the area of Talcahuano and Concepción make improbable the development of an accurate picture of the original diversity and distribution of aeglids. However, from the fact that at least *A. concepcionensis* and *A. expansa* are found in small moderately fast running streams that drain the mountainous outcrops to the south of Concepción city, I tentatively conclude that they represent local highly derived species from stocks of more ample distribution. In the case of *A. expansa* such ancestral stock could have been the forerunners of *A. araucaniensis* and/or *A. laevis* (*sensu lato*), to which *A. expansa* seems more closely related.

ACKNOWLEDGMENTS

The author thanks Mr. J. Llanos the donation of the type specimen of *A. expansa*; Dr. Joel W. Martin, Natural History Museum of Los Angeles County, for a photocopy of H. H. Hobbs III' description of *A. schmitti*; the Smithsonian Institution (Washington, D.C.) the ten week fellowship that allowed me to compare the holotype of *A. expansa* with the type-series of *A. schmitti*, *A. l. laevis* and *A. l. talcahuano*, and with paratypes of *A. castro*, *A. o. odebrechtii* and *A. o. paulensis*, at the National Museum of Natural History; Dr. Ardis B. Johnston,

Curator of Invertebrates at the Museum of Comparative Zoology, Harvard University, Cambridge, for her readiness to lend me the neotype and paratypes of *A. l. laevis* and the holotype and paratypes of *A. l. talcahuano*, and Dr. Raymond B. Manning, Nat. Mus. Nat. Hist., Washington, his comments to an earlier version of the MS. This publication was partially financed by grants FONDECYT 91-0900 and DID S-91-4, Universidad Austral de Chile.

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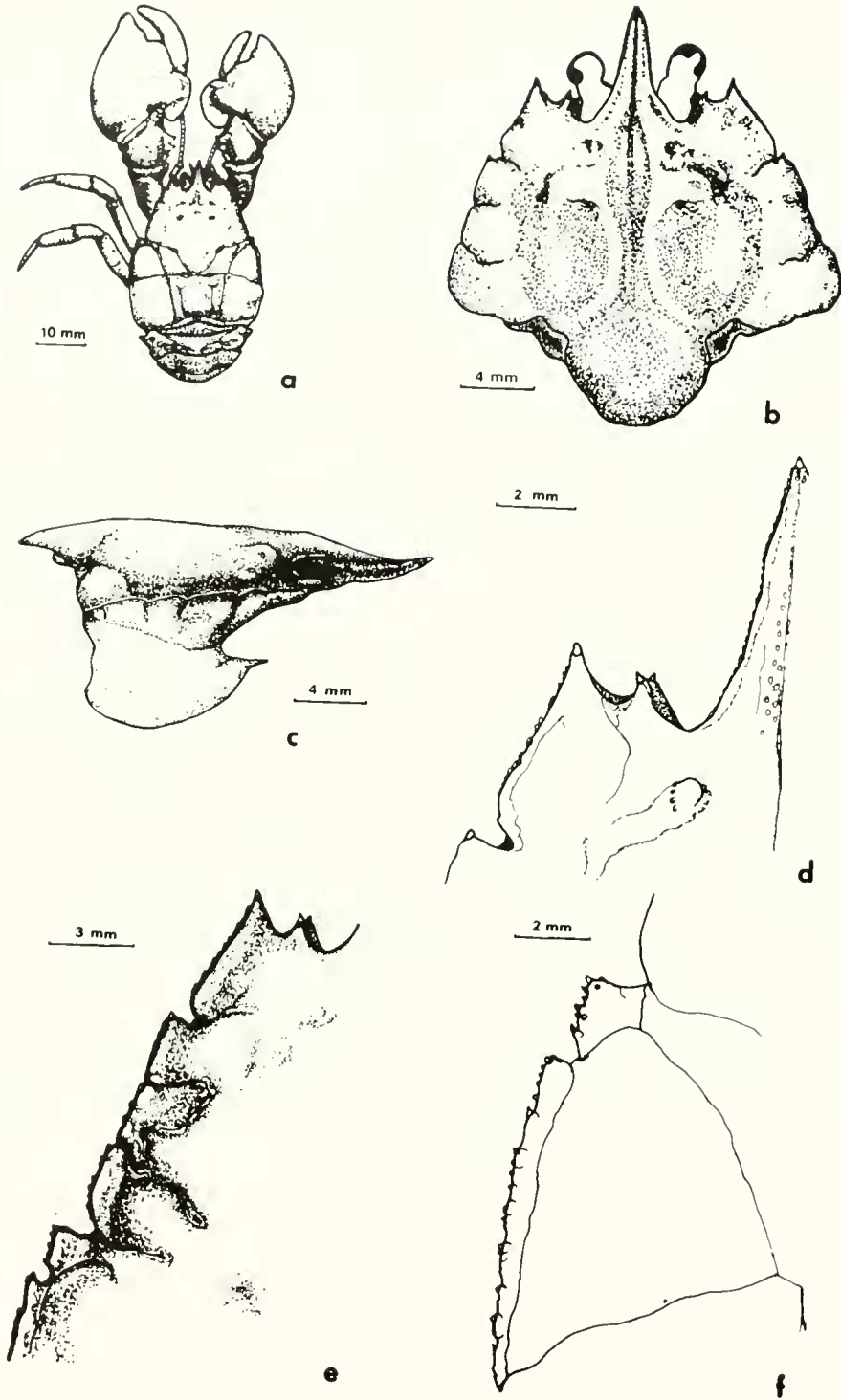


FIGURE 1. *Aegla expansa*, holotype. a, dorsal aspect; b, dorsum of precervical carapace; c, lateral profile of the same; d, scales on margin of the anterolateral lobe of carapace, orbital spines and rostrum, left half of carapace; e, margin of left half of precervical carapace showing hepatic lobes and epibranchial tooth; f, scales on margin of left anterior branchial area and epibranchial tooth.

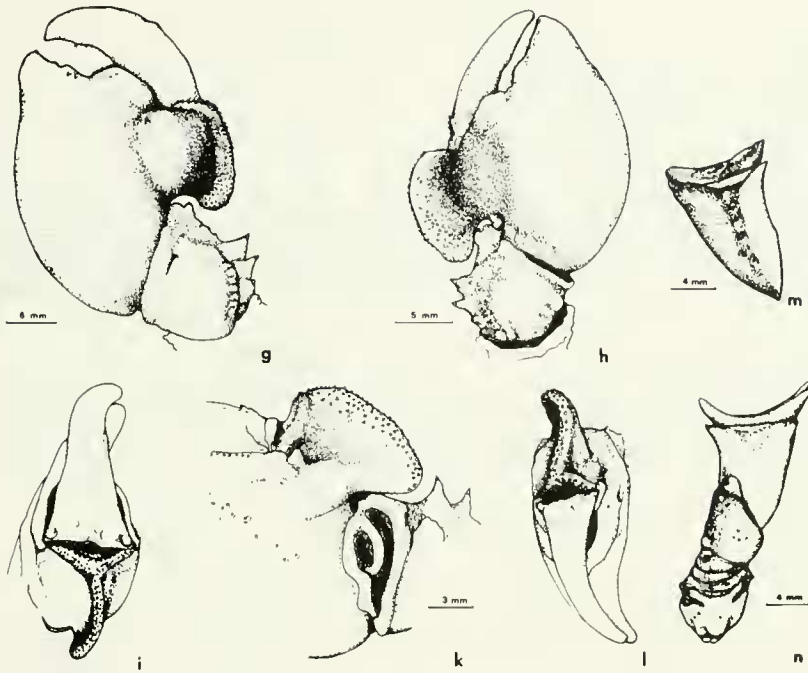


FIGURE 1. *A. expansa*, holotype. **g**, dorsal view of left chela; **h**, same of right chela; **i**, sagittal view of left cheliped palmar crest; **k**, ventral view of right cheliped palmar crest; **l**, sagittal view of right cheliped palmar crest; **m**, dorsum of left cheliped merus; **n**, ventral view of proximal articles of left cheliped.

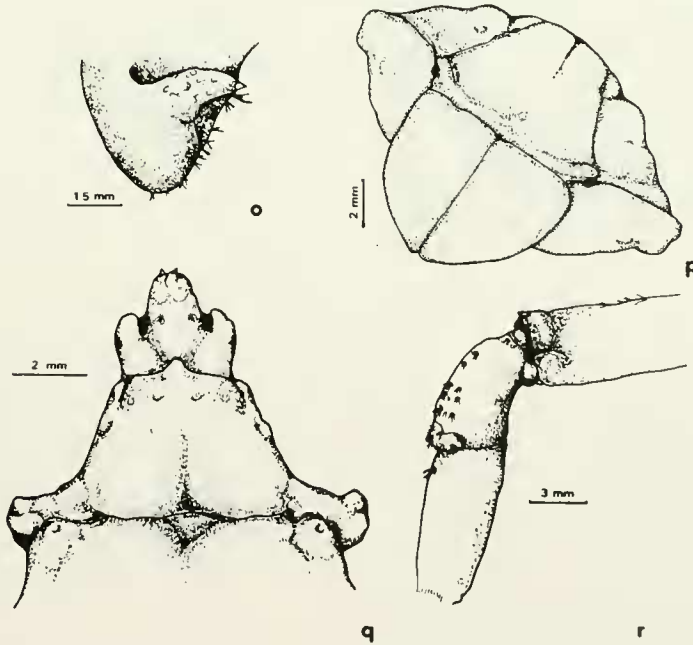


FIGURE 1. *A. expansa*, holotype. **o**, lateral view of second abdominal epimeron; **p**, telson plate; **q**, ventral view of third and fourth thoracic sterna; **r**, merus, carpus and propodus of left second pereopod.